Department for the Economy
An Roinn Geilleagair
www.economy-ni.gov.uk

# CONSULTATION ON SUPPORT FOR LOW CARBON HEATING IN RESIDENTIAL BUILDINGS

## ANNEXES

OCTOBER 2024

# Annex A
# A summary of low carbon heating technologies

1. An **air-to-water (air source) heat pump** uses electricity to transfer heat from the outside air to water, which is then used to provide space heating and hot water for a property. Space heating is provided to the property by radiators or similar heat emitters and hot water is held in a cylinder until required. A fan draws air from outside and passes it across a heat exchanger. A refrigerant is pumped on a loop, first from the initial heat exchanger to a compressor, where increasing pressure is used to raise the temperature of the refrigerant. A second heat exchanger transfers heat to water, for use in the property.
2. An **air-to-air (air source) heat pump** uses electricity to transfer heat from the outside air to air inside a property. This heat pump is used to provide space heating to a property but does not provide hot water. Space heating is provided to the property through a fan-coil unit (with the interior device having the appearance of an air conditioner). Similar to an air-to-water heat pump, a fan draws air from outside and passes it across a heat exchanger. A refrigerant is pumped on a loop, compressing the refrigerant from the first heat exchanger to heat the air, before a second heat exchanger transfers the heat to air, where it is blown across a space. This technology can also operate as an air conditioner, blowing cool air across a space.
3. A **hybrid heat pump** is a heat pump that is used alongside another heat source, typically a gas, oil, or LPG boiler. An **"all-in-one" hybrid** is a single off-the-shelf product that combines the heat pump, boiler and associated controls in one unit. The intended use is that the additional boiler will be used to "top-up" a heat pump output to meet the heating demands of the property. A control unit can be set to enable each heating source to switch on when needed, depending on efficiency and cost settings.
4. It is possible to install a **heat pump alongside a new boiler, or alongside an existing boiler**. This hybrid heat pump is often referred to as a "bivalent" system. Use-cases could include where the additional boiler is used to "top-up" a heat pump output to meet the heating demands of the property (for example, in cold weather) or the boiler could be used for hot water with the heat pump used for space heating. A control unit can be set to enable each heating source to switch on when needed, depending on efficiency and cost settings.
5. **Other air source heat pumps** include exhaust air heat pumps, solar-assisted heat pumps, and domestic hot water heat pumps. Exhaust air heat pumps are used in properties with mechanical ventilation systems. A solar-assisted heat pump combines an air-to-water (air source) heat pump with a solar collector panel. The solar collector (evaporator panel) replaces the external fan used on a conventional air source heat pump. These heat pumps are also known as thermodynamic panel heat pumps. A domestic hot water heat pump is an air-to-water heat pump that supplies hot water to a cylinder for use in the property. Depending on the model and the configuration chosen by the installer or the property owner, the air intake to the heat exchanger may come from external air or use air from within the property.

6. A **ground-to-water (ground source) heat pump** uses electricity to transfer heat from the ground to water, which is then used to provide space heating and hot water for a property. Space heating is provided to the property by radiators or similar heat emitters and hot water is held in a cylinder until required. A transfer fluid containing water and antifreeze is pumped around a loop of pipes underground. This loop of pipes can be for an individual property or shared between multiple properties. If the loop is shared with other properties, each individual property will still have a heat pump unit containing a heat exchanger. Similar to an air-to-water heat pump, the heat is passed through a heat exchanger to a refrigerant, the refrigerant is compressed to increase its temperature, before another heat exchanger is used to transfer the heat to water within a property. A system with a shared loop is sometimes referred to as an "ambient heat network".
7. A **water-to-water (water source) heat pump** uses electricity to transfer heat from an external body of water, which is then used to provide space heating and hot water for a property. Space heating is provided to the property by radiators or similar heat emitters and hot water is held in a cylinder until required. Initial heat retrieval can be done as a closed-loop (pumping a transfer fluid of water and antifreeze around a loop of pipes within the water body), or an open-loop (extracting water from the source itself before returning it). Similar to an air-to-water heat pump, the heat is passed through a heat exchanger to a refrigerant, the refrigerant is compressed to increase its temperature, before another heat exchanger is used to transfer the heat to water within a property.
8. There are a number of possible designs for a **gas-driven heat pump**. It is possible to use natural-gas combustion to power a compressor which forms part of a typical air-source heat pump cycle. Gas absorption heat pumps use a gas burner to heat a solution (typically ammonia and water) in place of the compressor used in other heat pumps. Ammonia gas enters a condenser as part of an absorption cycle and this releases heat for space heating and hot water in the property. These heat pumps are sometimes referred to as thermally-driven heat pumps.
9. A **biomass boiler** generates heat by burning wood in the form of pellets, chips or logs. It works in a similar way to a gas or oil boiler, producing heat through combustion, and is connected to a central heating system to provide space heating and hot water, which is stored in a hot water cylinder until needed. Biomass boilers need more space than gas or oil boilers because the system is larger. Space is also required to store the fuel itself, such as in a hopper or wood store. In some products the biomass fuel is automatically fed into the boiler when required.
10. A **biomass stove** burns wood for the primary purpose of heating a single room. Some products may also burn other fuels such as coal. The stove may be connected to a central heating and hot water system. Some stove products are automated (for example, in the feeding of wood pellets to the stove).
11. A **solar thermal** heating system uses panels or tubes to gather solar energy. These solar collectors convert the infra-red portion of visible light into heat. They are filled with a mix of water and glycol. This fluid is pumped round a circuit, which passes through the hot water cylinder. A conventional boiler or immersion heater is normally used to top up the hot water to meet requirements.
12. **Solar photovoltaic-thermal (PVT)** panels combine photovoltaic and thermal technologies. This means that they're able to convert solar energy into electricity and domestic hot water.

13. **Electric heating** refers to any system that uses electricity as the main energy source to heat the home. It covers many types of heating, but for most people it would mean either storage heaters, electric boilers or electric panel heating. Electric storage heaters use electricity to generate heat. This heat is stored inside the core of the heater, which is often made from heavy clay blocks. They are designed to be paired with electricity tariffs that supply electricity at cheaper rates at certain times of the day. An electric boiler heats water using electricity and circulates that warm water through radiators or underfloor heating pipes. Usually, these systems include a large hot water cylinder to store the heat, and are paired with special electric meters, which provide cheaper electricity units at certain times of day.
14. **Micro combined heat and power (micro-CHP)** is a technology that generates heat and electricity simultaneously, from the same energy source. The main output of a micro-CHP system is heat, with some electricity generation, at a typical ratio of about 6:1 for domestic appliances. Micro-CHP systems are usually powered by mains gas or liquified petroleum gas (LPG), however some models are now powered by oil or bio-liquids, including biodiesel. Although gas and LPG are fossil fuels rather than renewable energy sources, the technology is considered a low carbon technology because it can be more efficient than just burning a fossil fuel for heat and getting electricity from the grid.
15. **Hydrotreated Vegetable Oil (HVO)** is a biofuel derived from a renewable feedstock that is used as a replacement fuel for home heating oil. It is also a transport fuel. Minor modifications are required to an domestic oil boiler to enable it to use HVO.
16. **Bio-LPG** is a drop-in replacement for Liquefied Petroleum Gas (LPG). It is combusted in a boiler in the property and used for space heating or hot water. It is produced from renewable feedstocks such as plant and vegetable waste material.
17. A **heat network**, or district heating, replaces the need for individual boilers in a property, Heat is delivered from a centralised energy centre via pipes carrying hot water. This energy centre could use fossil fuels, renewable energy, or waste heat from commercial and industrial processes nearby. A shared ground loop for use with a ground source heat pump is sometimes referred to as an “ambient heat network” but is considered in this document as a “ground source heat pump”.
18. A **heat battery**, also known as a thermal battery or thermal store, stores spare heat for use later. It could take the form of a highly insulated water tank or a phase-change material (which changes between solid and liquid states in response to heat). **Heating controls** is a term that covers timers, thermostats and electronic components that manage when the heating in a property should come on and what temperature the rooms should be. The controls may be “smart” and allow for control by other devices such as smartphones or learn the routines of the occupants in the property to adjust the thermostats as needed, or provide weather compensation and similar features.

# Annex B
## Worked Example of emissions calculations referenced in Chapter 1.

| | | |
|---|---|---|
| A | Natural gas fuel emissions factor (all scopes)[1]: | 0.213 $kgCO_2e/kWh$ |
| B | Oil fuel emissions factor (all scopes): | 0.298 $kgCO_2e/kWh$ |
| C | Northern Ireland electricity emissions factor[2]: | 0.347 $kgCO_2e/kWh$ |
| D | Natural gas boiler efficiency assumption: | 84%[3] |
| E | Oil boiler efficiency assumption: | 84%[4] |
| F | Electric heating (excluding heat pumps) efficiency assumption: | 100% |
| G | Heat pumps efficiency assumption: | 280%[5] |
| A÷D | Natural gas heating emissions (per kWh heat delivered) | 0.254 $kgCO_2e/kWh$ |
| B÷E | Oil heating emissions (per kWh heat delivered) | 0.355 $kgCO_2e/kWh$ |
| C÷F | Electric heating emissions (per kWh heat delivered): | 0.347 $kgCO_2e/kWh$ |
| C÷G | Heat pump emissions (per kWh heat delivered): | 0.124 $kgCO_2e/kWh$ |

A heat pump has the lowest emissions of the options (0.124 $kgCO_2e/kWh$), with oil having the highest emissions as shown (0.355 $kgCO_2e/kWh$). Electric heating, such as electric panel heaters that operate with a typical efficiency of 100%, have higher emissions per kWh than natural gas.

1 UK Government -Greenhouse gas reporting: conversion factors 2023
2 Department of Agriculture, Environment and Rural Affairs - Northern Ireland carbon intensity indicators 2022
3 UK Government - Clean Heat Market Mechanism Impact Assessment (Table 10)
4 UK Government - Clean Heat Market Mechanism Impact Assessment (Table 10)
5 The Boiler Upgrade Scheme in England and Wales requires that all heat pumps have a minimum SCOP rating of 2.8 (i.e. 2.8 units of heat are produced from every unit of electricity input).

# Annex C

## Table 1 - Proposed eligibility of technologies and reason for eligibility decision

| Technology | Technology subcategory | Eligibility | Reason for eligibility decision |
|---|---|---|---|
| **Air-to-water heat pump** | Not Applicable | Eligible | The technology is consistent with all criteria |
| **Air-to-air heat pump** | Not Applicable | Not eligible | The technology only supplies space heating and does not supply hot water. Additional consideration would also have to be given in the scheme rules to ensure that the full space heating requirements of the property are met as heat emitters are installed to individual rooms (see criteria 7). |
| **Hybrid ASHP** | All-in-one hybrid heating product | Not eligible | The technology would involve the combustion of a fossil fuel (see criteria 3). |
| **As above** | New separate fossil fuel boiler | Not eligible | As above |
| **As Above** | Retain existing separate fossil fuel boiler | Not eligible | As Above |
| **Other ASHP** | This includes exhaust air heat pumps, solar-assisted heat pumps and domestic hot water heat pumps. | Not eligible | There are a range of products available in this technology category which are less common than other heat pumps. Solar-assisted heat pumps and domestic hot water heat pumps do not deliver the full space heating and hot water requirements of a property (see criteria 7). Exhaust air heat pumps have a specialist application to properties with mechanical ventilation heat recovery systems |
| **Ground-to-water heat pump** | This includes systems that use a shared ground loop. | Eligible | The technology is consistent with all criteria. |
| **Water-to-water heat pump** | This includes systems that use a shared ground loop. | Eligible | The technology is consistent with all criteria. |
| **Gas driven heat pump** | Not Applicable | Not eligible | This technology operates solely by the combustion of a fossil fuel (see criteria 3). |
| **Biomass boiler** | Not Applicable | Not eligible | Use of the technology can cause adverse effects on air quality and subsequently human health (see criteria 4). |

| Technology | Technology subcategory | Eligibility | Reason for eligibility decision |
|---|---|---|---|
| **Biomass stove** | Not Applicable | Not eligible | Use of the technology can cause adverse effects on air quality and subsequently human health (see criteria 4). The principal use of the technology is to provide space heating to an individual room which will not deliver the full space heating and hot water requirements. The technology is unlikely to be the primary means of heating the property (see criteria 7). |
| **Solar thermal** | Not Applicable | Not eligible | Solar thermal technologies supply hot water only and are not used for space heating (see criteria 7). |
| **Solar PV-T** | Not Applicable | Not eligible | Solar thermal technologies supply hot water only and are not used for space heating (see criteria 7). It is proposed that a scheme will not support technologies that also generate electricity (see criteria 6). |
| **Electric heating** | Electric boiler | Not eligible | The product efficiency is limited to 100%, which is inconsistent with criteria 2. Electric panel radiators and storage heaters are unable to supply the full space heating and hot water requirements of a property (see criteria 7). |
| **As Above** | Electric panel radiators | Not eligible | As Above |
| **As Above** | Storage heaters | Not eligible | As Above |
| **Micro CHP** | Not Applicable | Not eligible | This technology generates electricity (likely for export) as well as heat (see criteria 6). Products except for biomass types use fossil fuels (see criteria 3). The market for these products in the domestic setting is believed to be negligible. |
| **HVO boiler** | Not Applicable | Not eligible | There is believed to be minimal capital cost required to switch from oil to HVO. The premium in consumer costs is relating to the fuel used (see criteria 1). |
| **BioLPG boiler** | Not Applicable | Not eligible | There is believed to be no, or minimal, capital cost required to switch from LPG to bioLPG. The premium in consumer costs is relating to the fuel used (see criteria 1). |
| **Connection to heat network** | Not Applicable | Not eligible | The technology would not be microgeneration (see criteria 5).<br><br>The technology is consistent with all other criteria. Additional consideration would have to be given in scheme rules to ensure that the heat network does not operate using fossil fuels (see criteria 3). |
| **Heat battery** | Not Applicable | Not Applicable | This technology offers the potential to store heat created by other forms of low carbon microgeneration (in itself does not generate heat) but would only supplement another form of heating (see criteria 5 and 7). |

## Annex D

**Table 2 - Technologies supported by the Northern Ireland Domestic Renewable Heat Incentive (RHI) scheme (now closed to new participants) and current schemes in other jurisdictions.**

| Northern Ireland Domestic RHI Scheme (2014-2016[6]) | Boiler Upgrade Scheme (England and Wales) | Home Energy Scotland Grant and Loan programme | Republic of Ireland Energy Upgrade Grant programme |
|---|---|---|---|
| Air source heat pump (ASHP) | Air source heat pump (ASHP) | Air source heat pump (ASHP) | Air source heat pump (ASHP) |
| Ground source heat pump (GSHP) | Ground source heat pump (GSHP) [7] | Ground source heat pump (GSHP) | Ground source heat pump (GSHP) |
| Water source heat pump (WSHP) | Water source heat pump (WSHP) | Water source heat pump (WSHP) | Water source heat pump (WSHP) |
| Not Applicable | Not Applicable | Hybrid ASHP | Not Applicable |
| Not Applicable | Not Applicable | Not Applicable | Exhaust ASHP |
| Not Applicable | Not Applicable | Not Applicable | Air-to-air heat pump |
| Biomass boiler | Biomass boiler (limited circumstances) | Biomass boiler (if heat pump unsuitable for property) | Not Applicable |
| Biomass stove | Not Applicable | Biomass stoves (limited product types, and if heat pump unsuitable for property) | Not Applicable |
| Solar thermal | Not Applicable | Solar thermal (loan only) | Solar thermal |
| Not Applicable | Not Applicable | Solar photovoltaic-thermal (PVT) (loan only) | Not Applicable |
| Not Applicable | Not Applicable | Connection to a renewably powered heat network (loan only) | Not Applicable |
| Not Applicable | Not Applicable | Heat batteries | Not Applicable |
| Not Applicable | Not Applicable | Not Applicable | Heating controls |

Please note that, unless stated otherwise, a “heat pump” refers to a heat pump for a water-based central heating system (these are sometimes referred to as “air-to-water”, or ‘’ground-to-water’’).

6 The Northern Ireland Domestic RHI Scheme was open for applications between these years. The scheme has now come to a natural close due to the end of the support period set out in the relevant regulations.

7 A grant is offered towards a ground source heat pump (including water source heat pumps and those on shared ground loops)

## Annex E
## Technical assessment process for heat pump grants - SEAI

1. The Heat Loss Indicator (HLI) is the total heat loss per square metre of dwelling floor area. This is defined as follows:
   *HLI= (Fabric Heat Loss + Ventilation Heat Loss)/(Floor area of dwelling) [W/(K· m^2 )*
2. The technical assessor will, in addition to the standard BER assessment, calculate the HLI of the home which must be 2 or less to make it suitable for the installation of a heat pump to SEAI standard. If the home has a HLI greater than 2, the technical report will provide a guide to the required upgrades to make the home 'heat pump ready'.
3. Where the HLI is between 2 and 2.3 W/K $m^2$, SEAI advise that in some cases it may not be economically feasible to upgrade the home further and that cost savings may not be significant, depending on the fuel and efficiency of the current heating system.
4. An HLI of less than or equal to 2.3 can be accepted where the following requirements are met[8]:
   - Maximum exposed wall U-value 0.37 W/$m^2$K,
   - Maximum roof U-value 0.16 W/$m^2$K or 0.25 W/$m^2$K where not accessible (e.g. flat roof or rafters),
   - Maximum Window U value 2.8 W/$m^2$K(and double glazed). The cost optimal window performance is 1.4 W/$m^2$K, however a value of 2.8 W/$m^2$K recognises that it may not be economically feasible to upgrade windows and
   - Maximum Adjusted Infiltration Rate of 0.5 ac/h.

8 Sustainability Energy Authority of Ireland - Better Homes: Technical Assessment Process for Heat Pump System Grants

# Annex F

## Summary of assumptions used for Figure 4 – heating system running cost comparison (fuel only).

| Assumption Number | Description | Assumption |
|---|---|---|
| **1** | Annual heat demand | The annual heat demand used is 9,322 kWh which is based on a five-year average of gas consumption of domestic properties in NI[9] (11,097.2kWh) with a gas boiler efficiency of 84% - see assumption number 9. |
| **2** | Date taken for supplier prices | 28th April 2024 |
| **3** | Basis of supplier prices | Gas and Electricity prices used are based on the average of the cheapest supplier value and the oil price used is based on the average oil prices based on 1,000 litres. |
| **4** | Gas tariff | 9.70 p/kWh - Based on a location of Greater Belfast (Note 1) |
| **5** | Oil Price per litre | 65.24 p/litre based on the average price of oil in NI per Boiler Juice Website (Note 2) |
| **6** | Oil Calorific Value | 10.30 kWh/litre[10] (See Conversion factors 2023 – condensed set - 'fuel properties worksheet', cell K17 on link footnote 2) |
| **7** | Oil Price per kWh | 6.33 p/kWh (Price per litre/calorific value) |
| **8** | Electricity Price per kWh | 26.95 p/kWh – no standing charge per day has been included as it has been assumed that this will apply to other household appliances already. (Note 3) |
| **9** | Gas boiler efficiency | Two values have been used for comparison purposes - 84% and 90%. The value of 84% is an average based on Table 10 of the CHMM impact assessment[11] and 90% refers to the upper range of boiler performance as per the Department of Energy and Climate Change Final Report: In-situ monitoring of efficiencies of condensing boilers and use of secondary heating[12]. |
| **10** | Oil boiler efficiency | Two values have been used for comparison purposes - 84% and 90%. The value of 84% is an average based on Table 10 of the CHMM impact assessment and a 90% value has been used in line with gas boiler efficiency for cost comparative purposes. |
| **11** | Heat pump SCOP | A SCOP range of 2.2 to 4.0 has been used for an ASHP for comparison purposes. |

### Note 1 - Gas Tariff [13]

| | | | |
|---|---|---|---|
| Supplier's cheapest rate | SSE Airtricity | 8.87 | p/kWh |
| Supplier's cheapest rate | Firmus | 10.53 | p/kWh |
| Supplier's cheapest rate | Average tariff cost (across all suppliers) | 9.70 | p/kWh |

9 UK Government - Gas Consumption statistics for NI
10 UK Government - Greenhouse gas reporting: conversion factors 2023
11 UK Government - Clean Heat Market Mechanism Impact Assessment (Table 10)
12 Department of Energy and Climate Change - Monitoring of Condensing Boilers
13 Consumer Council | Gas Prices for Greater Belfast

### Note 2 - Oil Price[14]

Taken as the average price of oil as at 28th April 2024 for Northern Ireland per Boiler Juice – 65.24p/litre

### Note 3 - Electricity Price [15]

| | | | |
|---|---|---|---|
| Supplier's cheapest rate | Power NI | 27.94 | p/kWh |
| Supplier's cheapest rate | SSE Airtricity | 25.48 | p/kWh |
| Supplier's cheapest rate | Budget Energy | 25.19 | p/kWh |
| Supplier's cheapest rate | Electric Ireland | 30.10 | p/kWh |
| Supplier's cheapest rate | Click Energy | 26.02 | p/kWh |
| Supplier's cheapest rate | Average tariff cost (across all suppliers) | 26.95 | p/kWh |

14 Boiler Juice NI - Home Heating Oil Prices
15 Electricity Price Comparison Table 28 April 2024 | Consumer Council

# Annex G
## Summary of SEAI requirements for installers and installations

Information here is sourced from the SEAI Domestic Technical Standards and Specifications (Contractors Code of Practice)[16], SEAI Renewable Energy Installer Registration[17], SEAI Contractor Registration[18]

| **Heat pump** | |
|---|---|
| Installer | Installation |
| All works must be completed by a contractor on SEAI's registered list. Contractors on this list commit to using a standard contract. Standard contract has a two-year guarantee on workmanship.<br><br>To be registered, a contractor must demonstrate certification from an accredited training provider.<br><br>For registration, contractors must demonstrate proof of public and product liability insurance.<br><br>Installed by suitably qualified personnel. Those nominated to supervise and inspect the works, and to sign off the Declaration of Works must be competent in the different aspects of the works. This includes design, sizing and installation of the whole heat pump system.<br><br>Minimum qualifications are: Fetac/QQI Level 6 Advanced Craft in Plumbing, including a module on minor electrical works, or equivalent; Certificate of competence from the specific manufacturer of heat pumps installed; Fetac/QQI Level 6 Heat Pump Systems and supplemental Domestic Heat Pump Installation or equivalent. | A manufacturer, system supplier and/or Contractor guarantee must be issued to the customer. The<br><br>provision of goods and/or services by Contractors to customers of these Programmes is entirely a matter between the Contractor and the customer. SEAI does not provide any warranty or guarantee concerning the completeness, effectiveness, reliability, accuracy or otherwise of the standards referenced in this document or any work carried out on foot of such standards. This does not affect your statutory rights.<br><br>In addition to a minimum manufacturer's guarantee of 3 years on the heat pump unit(s), and to the manufacturer's guarantees on other new parts, the whole heat pump system in its design and installation aspects must be covered by a minimum installer's guarantee of 2 years. |

16 Sustainability Energy Authority of Ireland - Contractors Code of Practice
17 Sustainability Energy Authority Ireland - Renewable Energy Installers
18 Sustainability Energy Authority Ireland - Contractors

## Annex H

## MCS note the below elements to becoming an MCS certified installer:

1. A commitment to quality workmanship - All installers are assessed against the MCS 001 Standard and the specific technical Standard for the technology you wish to become certified for; for example, for installers installing heat pumps would need to be assessed against the MIS 3005-I The Heat Pump Standard (Installation) and MIS 3005-D The Heat Pump Standard (Design).
2. Commitment to customer care - Prior to completing your MCS assessment, you need to belong to a Trading Standards Institute (TSI) approved Consumer Code. So, the first step to becoming an MCS certified contractor is to apply to join either the Renewable Energy Consumer Code (RECC) or the Home Insulation & Energy Systems Quality Assured Contractors Scheme (HIES).
3. Demonstrate competency – Your company will be requested to show that employees are fully competent, experienced and have the relevant skills to deliver the requirements of the consumer. These roles include the supply, design, installation, set to work and commissioning of the type of systems for which the company is seeking certification.
4. There are essentially two ways in which an installation company may prove the competency of its employees:
   - The first way is via in date qualifications held and/or short courses attended. The list of accepted qualifications and courses is included in the MCS Competency Guide
   - The second way is proving competency through demonstrating experience to your MCS Certification Body.
5. Committing to continual improvement through the deployment of an effective management system – An organisation seeking to become MCS certified needs to demonstrate the operation of a Quality Management System (QMS). The assessing Certification Body will ensure that your company has addressed the Standard requirements through documented procedures and systems. If installers have an existing QMS they should maintain these systems but if not MCS offer templates that to support installers creating a QMS. These templates can be found on the MCS website19.

19 MCS - Becoming certified

# Annex I
# Summary of Consultation Questions

**Question 1**
Do you agree with the criteria used to inform technology eligible for support?

- ❑ Yes
- ❑ No

If you do not agree, please explain why you do not agree and provide evidence to support your answer.

**Question 2**
Do you think that other criteria should be applied?

- ❑ Yes
- ❑ No

Please provide evidence to support your answer.

**Question 3**
The department does not intend to provide financial support for biomass boilers, do you think there should be exceptions to this?

- ❑ Yes
- ❑ No

Please give reasons for your answer

**Question 4**
The department does not intend to provide financial support for hybrid heat pumps, do you think there should be exceptions to this?

- ❑ Yes
- ❑ No

Please give reasons for your answer

**Question 5**
Should a minimum Seasonal Co-efficient of Performance of at least 2.8 or higher be applied to the low carbon technologies considered for support? Please tick all that apply.

- ❑ Air Source Heat Pump
- ❑ Ground Source Heat Pump
- ❑ Water Source Heat Pump

Please give reasons for your answer

**Question 6**
Should all domestic buildings be eligible for low carbon heating technology support?

- ❑ Yes
- ❑ No

Please give reasons for your answer.

**Question 7**
What minimum energy efficiency criteria in relation to domestic buildings should be met (if any) to make them suitable for a low carbon heating technology support?

- ❑ Option A – No minimum energy efficiency requirements
- ❑ Option B – A valid EPC with no loft or wall insulation recommendations.
- ❑ Option C – An energy assessment of the home conducted by a technical adviser.
- ❑ Option D – A minimum standard of EPC rating.
- ❑ Option E – Other method (please specify).

Please give reasons for your answer.

**Question 8**
If you selected Option C – do you think support should be available towards the costs associated with an energy assessment as part of support for the installation of the low carbon technology?

- ❑ Yes
- ❑ No

Please give a reason for your answer.

**Question 9**
Do you agree that support for low carbon heating technologies is provided separately for owner-occupiers with alternative provision of support made for landlord, social housing, and non-domestic properties?

- ❑ Yes
- ❑ No

Please give reasons for your answer.

**Question 10**
Do you agree that self-build properties should be eligible for support at this time?

- ❑ Yes
- ❑ No

Please give reasons for your answer.

**Question 11**
Do you think additional financial support should be available to those homes in rural and island locations?

- ❑ Both – rural and island
- ❑ Rural only
- ❑ Island only
- ❑ Neither

Please provide reasons for your answer.

**Question 12**
If you answered yes to Question 11, how would homes be identified as rural by the department?

Please provide reasons for your suggestion.

**Question 13**
Do you agree that to be eligible for support, a new heating installation should replace fossil fuel heating, replace direct electric heating, or be installed where no central heating currently exists?

- ❑ Yes
- ❑ No

Please give reasons for your answer.

**Question 14**
Do you agree that replacing a low carbon heating system with another low carbon heating system should be ineligible for support?

- ❑ Yes
- ❑ No

Please give reasons for your answer

**Question 15**
Should households who have received energy efficiency support via schemes such as NISEP or Affordable Warmth be able to apply for additional low carbon heat support?

- ❑ Yes
- ❑ No

Please give reasons for your answer.

**Question 16**
Should support options be designed to prioritise or target certain groups of people (such as those on low incomes)?

- ❑ Yes
- ❑ No

Please give reasons for your answer. If you answered Yes, please detail which groups should be targeted and how could this be achieved?

**Question 17**
Should prioritisation or additional support be given to those with older (perhaps 15+ years) fossil fuel boilers?

- ❑ Yes
- ❑ No

Please give reasons for your answer.

**Question 18**
Should additional support be offered to the consumer where no central heating system is present in the home?

- ❑ Yes
- ❑ No

Please give reasons for your answer.

**Question 19**
Should those with multiple occupied properties e.g. holiday homes be eligible to apply for support for more than one property?

- ❑ Yes
- ❑ No

Please give reasons for your answer.

**Question 20**
Do you agree that the department has a requirement for consumer protection measures to be associated with support for low carbon heating technology?

- ❑ Yes
- ❑ No

Please give reasons for your answer

**Question 21**
What do you feel would be the best method of consumer protection?

- ❑ Option A - Need for installers to be registered to a certification scheme such as MCS.
- ❑ Option B - The department to set its own consumer protection requirements.
- ❑ Option C – Other

Please give reasons for your answer.

If you chose Option B or Other, what consumer protection requirements should be specified?

**Question 22**
If it is required for installers to be accredited to a certification scheme in order to take part in any future government support, should funding be made available towards certification fees?

- ❑ Yes
- ❑ No

Please give reasons and evidence to support your answer.

**Question 23**
Should any electrical work completed as part of the low carbon heating technology installation be required to be certified by an approved accredited body?

- ❑ Yes
- ❑ No

Please give reasons and evidence to support your answer.

**Question 24**
Do you agree with the criteria for the administration of support for low carbon heating technologies?

- ❑ Yes
- ❑ No

If no, please give reasons for your answer.

**Question 25**
Do you agree with the approach to offer support by providing a one-off capital grant?

- ❑ Yes
- ❑ No

If no, please give reasons for your answer.

**Question 26**
Which option do you think should be the approach to the level of financial support for eligible technologies? Please tick one box only.

- ❑ Option 1 – apply the same amount of funding for all eligible technologies.
- ❑ Option 2 – apply different amounts of funding per eligible technology type.
- ❑ Option 3 – other (please specify).

Please give reasons for your answer.

**Question 27**
Are there any cost barriers beyond the cost of the technology that you feel may impact on the successful rollout of low carbon heating technology support?

- ❑ Yes
- ❑ No

Please give reasons for your answer.

**Question 28**
Do you have suggestions as to how the department can ensure financial support delivers the best possible value for money?

- ❑ Yes
- ❑ No

Please give reasons for your answer.

**Question 29**
Is the supply chain and manufacturing base in NI well established to cope with demand for installations of low carbon heating technologies if demand increases?

- ❑ Yes
- ❑ No

Please give reasons for your answer

**Question 30**
Is there any evidence of after-care delays with repairs and maintenance of heat pumps due to supply chain shortages and delays that may cause someone to be without heating?

- ❑ Yes
- ❑ No

If yes, please provide evidence.

**Question 31**
How can growth of the skills base within the heat pump industry be supported by the private sector and government to complement any support for low carbon heating in

a) the short – medium term (up to 10 years) and

b) the long term (over 10 years)?

Please provide any evidence you may have.

**Question 32**
Is there an adequate amount of heat pump installers within NI to cope with demand for installations as well as aftercare and repairs/maintenance should demand for heat pumps increase in the short – medium term?

- ❑ Yes
- ❑ No

Please give reasons for your answer

**Question 33**
What actions can be taken to support the scaling and growth of the low carbon industry, particularly installers, to meet future demand projections of heat pump deployment targets?

Please give reasons for your answer